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(71) Applicant(s)

HEAT-N-GLO Fireplace Products Inc  
(Incorporated in USA - Minnesota)  
6665 West Highway 13, Savage, Minnesota 55378,  
United States of America

(72) Inventor(s)

Ronald John Shimek  
Daniel Curtis Shimek  
David Charles Lyons  
Robb Edward Bennett

(74) Agent and/or Address for Service

P A Michaels  
34 Marsh Road, Pinner, Middx, HA5 5NQ,  
United Kingdom

(51) INT CL<sup>6</sup>

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(56) Documents Cited

GB 2256920 A WO 98/41797 A2

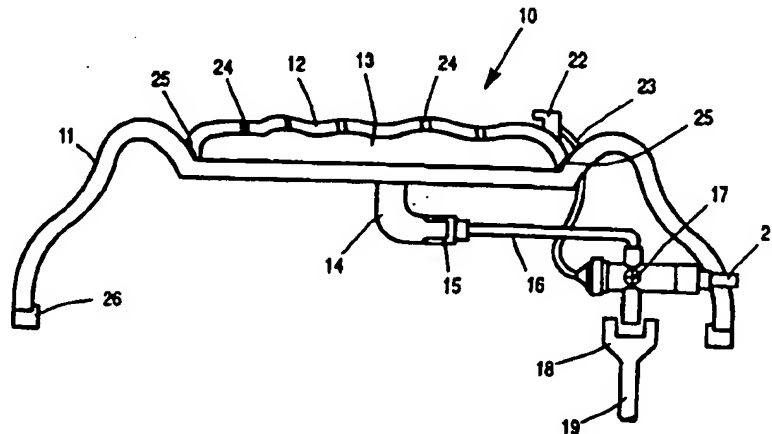
(58) Field of Search

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INT CL<sup>6</sup> A47J 37/07, F23D 14/00 14/16 14/46, F24C  
1/16 3/00 3/14  
Online: WPI, EPODOC, PAJ

(54) Abstract Title

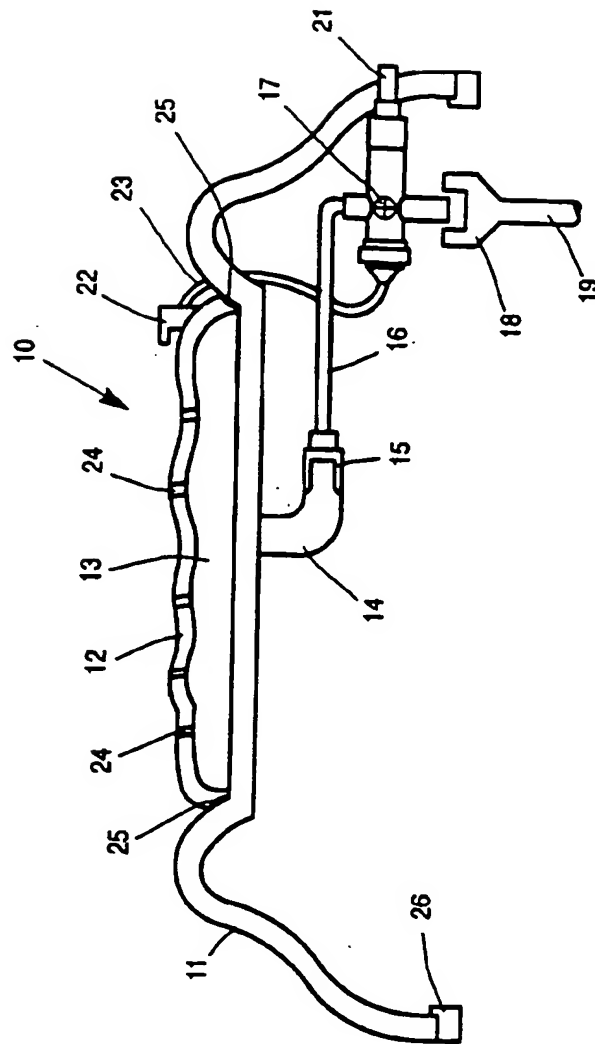
Portable gas burner

(57) The portable gas burner comprises a base unit 11 onto which is mounted a hollow ceramic fiber top 12 which is connected to the base unit so as to form a gas manifold 13 therebetween for receiving a mixture of gas and air. A manually operable gas valve means 17 in said base unit is connected to a gas supply and a primary air shutter valve 15 adjusts the air gas mixture. A pattern of burner jets 24 create one desired flame pattern. The valve maybe opened to allow a mixture of gas and air to flow through a gas line into the gas manifold until such time as a temperature thermocouple 22 sensing element is heated sufficiently to hold manually operable gas valve open. The burner may be associated with a decorative cover or a fireplace grate for supporting gas logs and may be used indoors or outdoors.

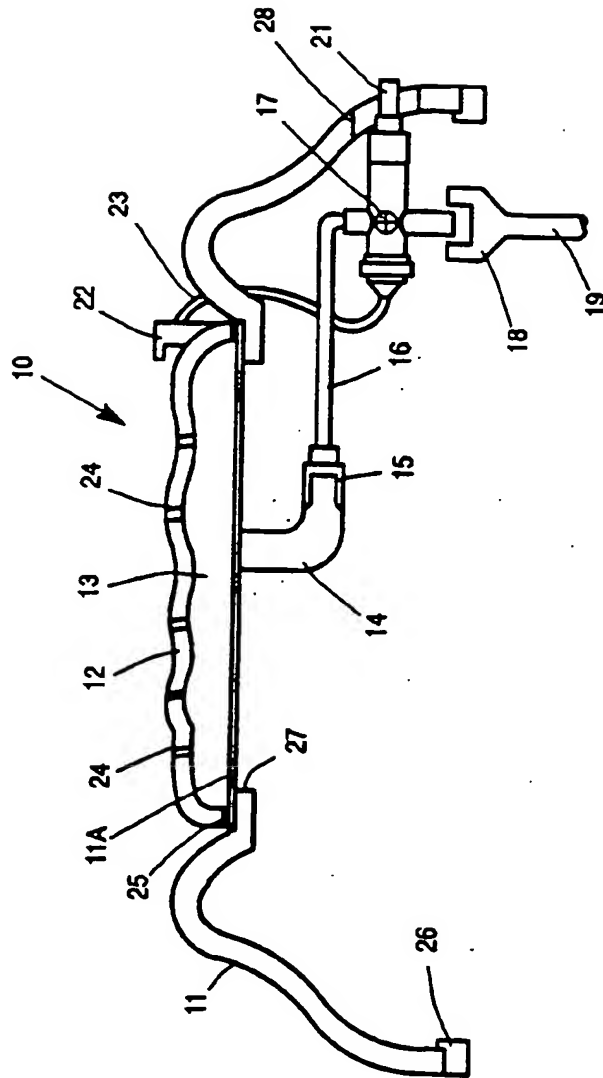


**Figure 1**

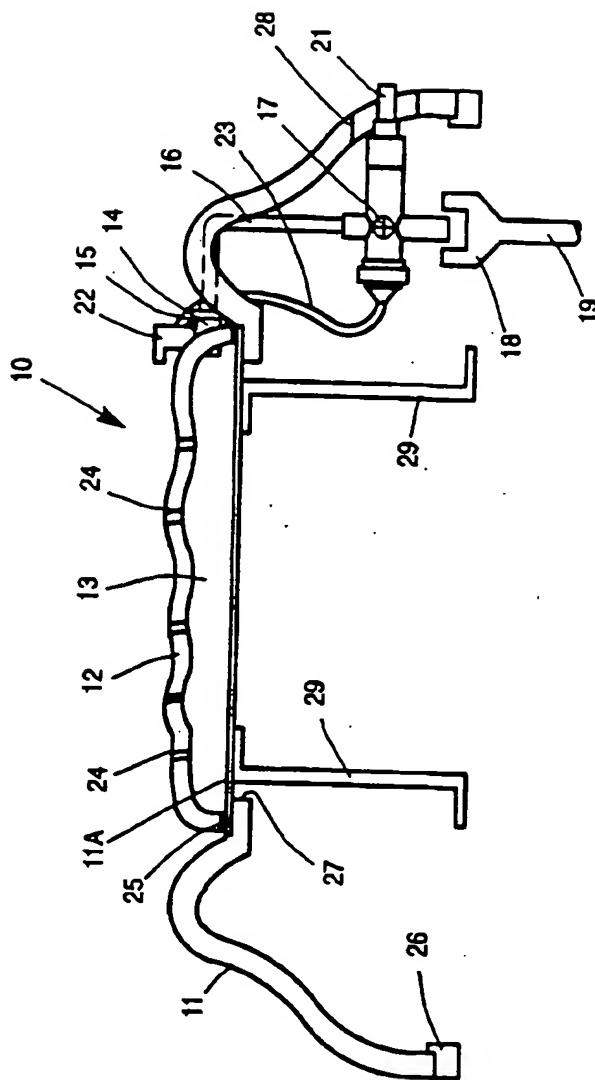
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**Figure 1**

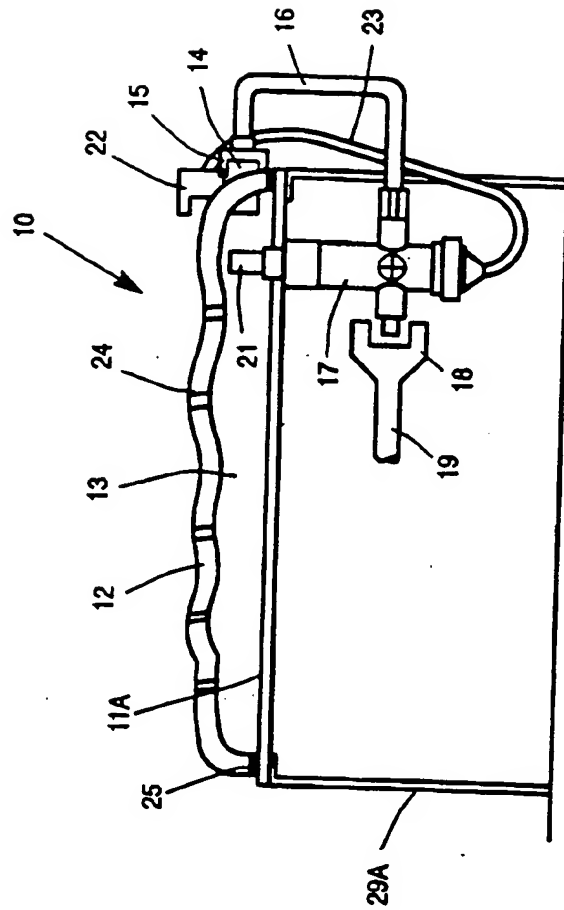


**Figure 2**

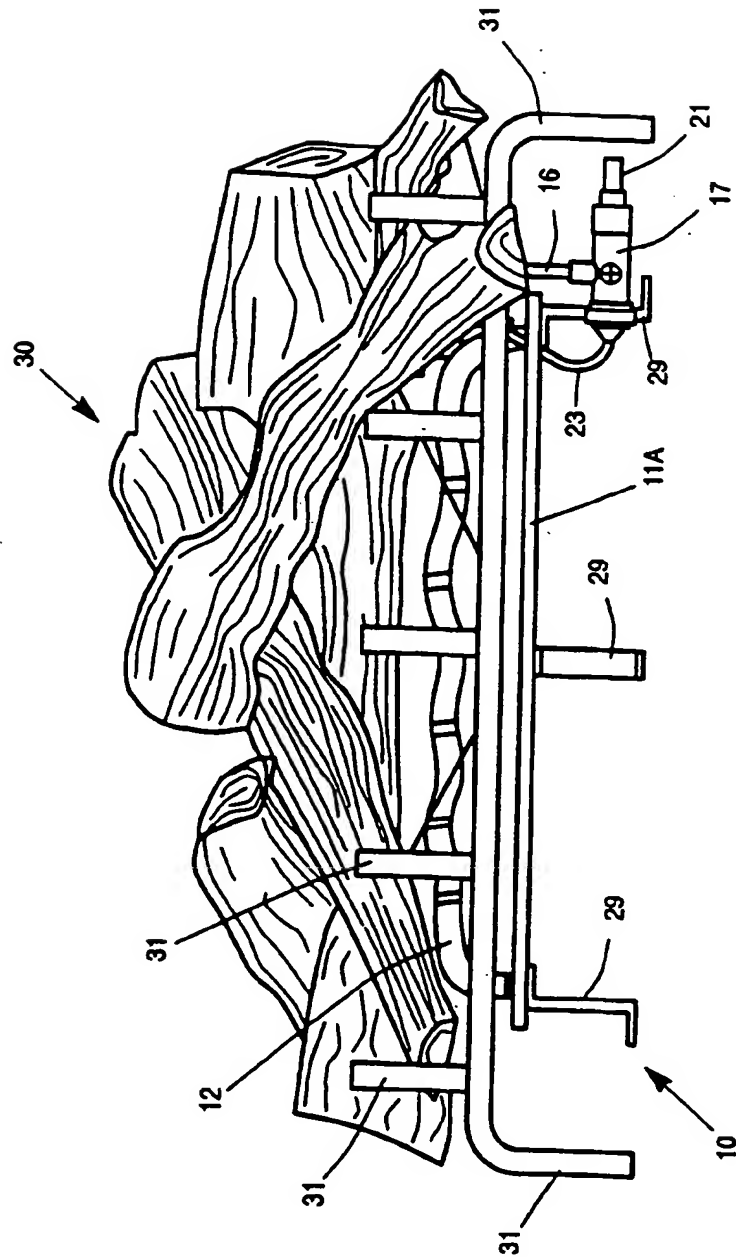


**Figure 3**

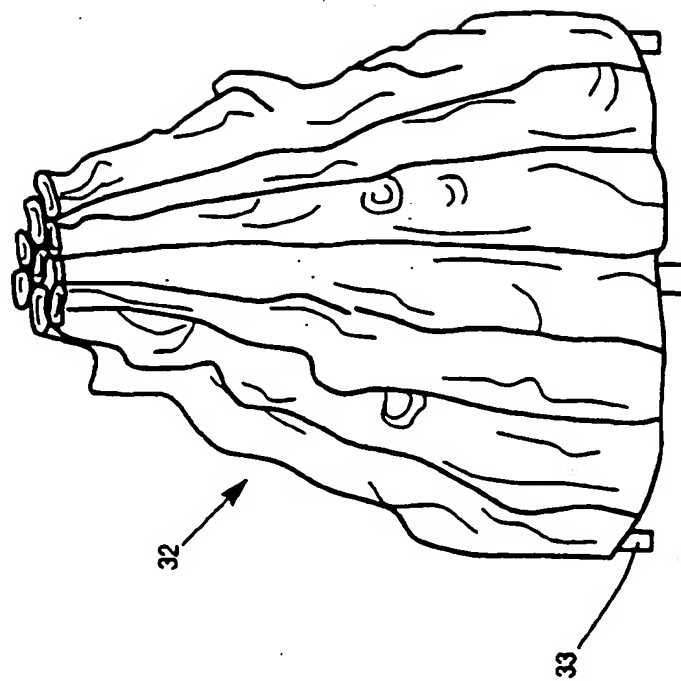
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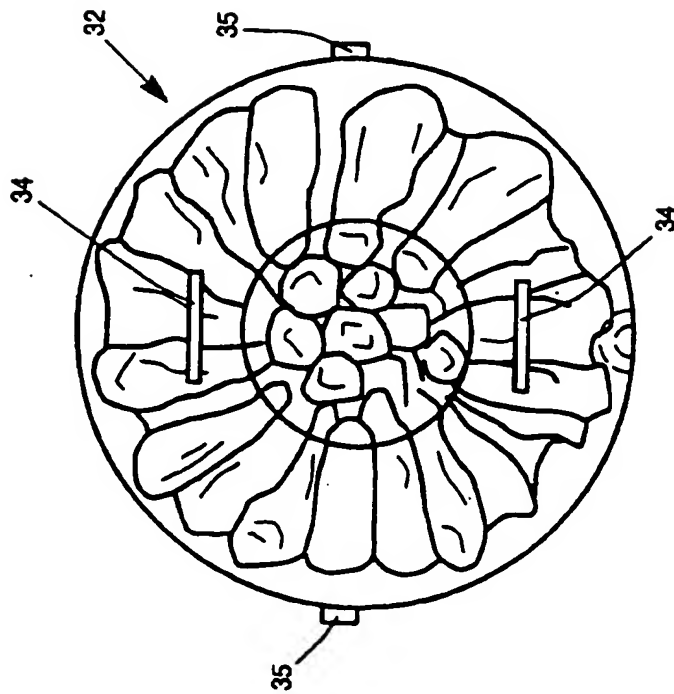
**Figure 4**



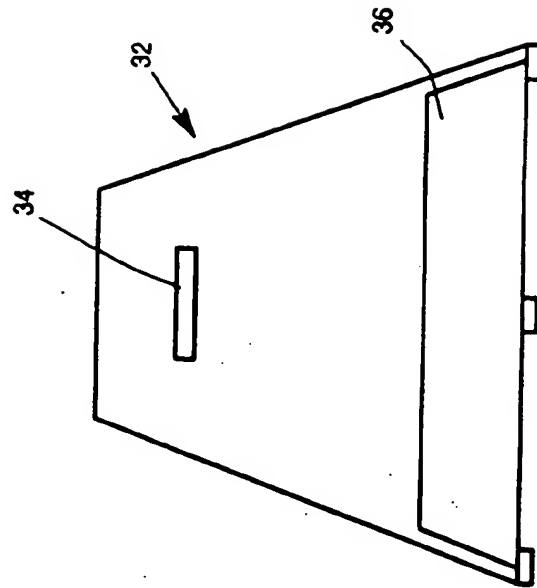
**Figure 5**



**Figure 6**



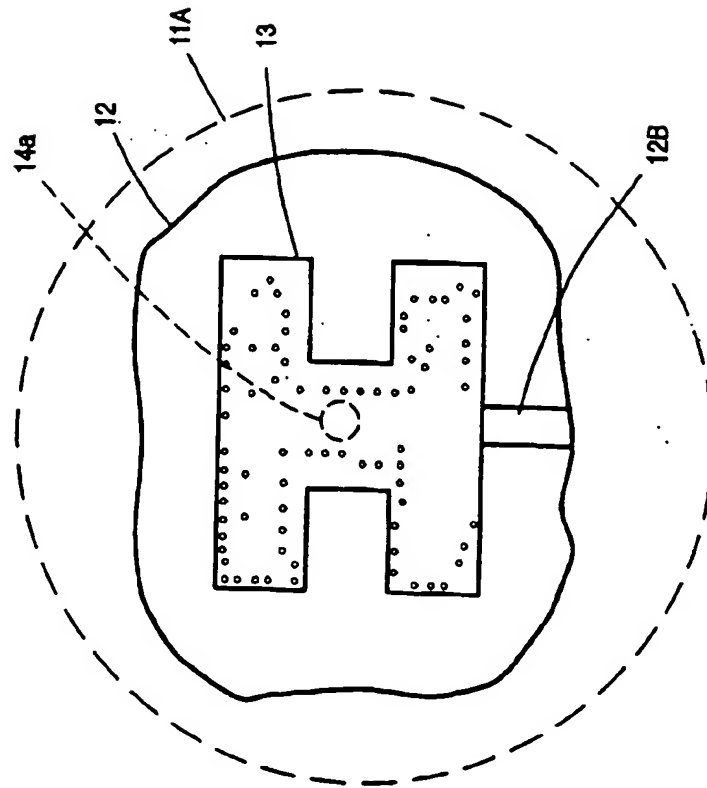
**Figure 7**



**Figure 8**

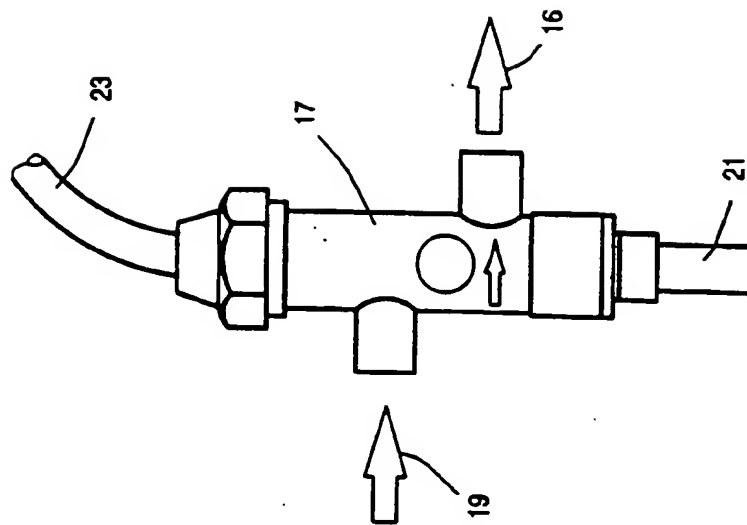


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**Figure 9**

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**Figure 10**

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AN INDOOR-OUTDOOR PORTABLE GAS BURNER  
BACKGROUND OF THE INVENTION

1. Field of the Invention

5 The present invention relates to efficient gas burners for burning natural gas and propane gaseous fuels. More particularly, the present invention relates to a novel gas burner system that may be used in fireplaces and/or camp fires and is portable to accomplish dual purposes.

2. Description of the Prior Art

10 Gas burners are classified in U.S. Class 126, sub-classes 91, 92R, 125, 126 and 512. In our U.S. Patent 5,601,073 there is disclosed and claimed a flat pan burner having a U-shaped base pan which is connected to a formed top layer. The burner in this patent was designed for and has been used in gas fireplaces.

15 In our co-pending U.S. Application Serial No. 08/705,845 filed 27 September 1996, there is shown and described hollow log burners of the type manufactured for use in artificial log camp fires. This latter burner system includes logs which have hollow passageways as well as burner jets for producing gas flames emitted from the logs.  
20 Such gas log units have been used in remote areas where natural gas is not available, thus, require that tanks of propane be provided and that the units can be disassembled and assembled at the camp site if stored in a disassembled or partially assemble condition. Such units are not usable  
25 as a grill or as a gas burner system for a gas fireplace, thus, are single purpose fireplace units.

It would be desirable to provide a novel dual purpose gas burner which may be used in a fireplace as a burner or on a deck as a campfire or a grill and/or as a portable and storable campfire-grill that may be set into operation by removing a storage cover and connecting a gas line to the burner unit.

#### SUMMARY OF THE INVENTION

It is a primary object of the present invention to provide an outdoor-indoor portable gas burner which is usable in fireplaces, on decks, in remote areas as a fireplace burner or as a campfire or grill.

It is another primary object of the present invention to provide a gas burner that may be mounted on and carried in a novel decorative covered unit.

It is another primary object of the present invention to provide a gas burner which may be set up and started immediately at a remote camp site as a heating unit or a stove or grill.

It is another primary object of the present invention to provide a gas burner which serves as a stove or heating unit in a cabin or house in a remote area where no natural gas is available.

It is another principal object of the present invention to provide a camp fire or stove cooking unit for use inside or outside of a living area.

It is another general object of the present invention to provide a novel gas burner-campfire-stove which may be set in operation immediately by plugging into a snap connector of a gas line and starting the burner. Conversely the unit can be unplugged from the gas line and replaced in a cover for storage.

According to these and other objects of the present invention, there is provided a portable gas burner for fireplaces and campfires which comprises a base unit and a top ceramic fiber unit connected to form a gas manifold therebetween. The gas manifold has a gas line connection for connecting a mixture of gas and air to the gas manifold. The novel gas burner unit is provided with a three dimensional contoured surface in the ceramic fiber top and a pattern of burner jets extend through the ceramic fiber top into the gas manifold for creating a desired gas flame pattern. The novel gas burner unit is ready to operate when plugged to a gas supply line and is ready to be stored when unplugged and covered with a novel molded or formed cover which preferably has a decorative look and serves a dual purpose for covering a propane tank.

#### BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a diagrammatic drawing in partial section showing a preferred embodiment indoor-outdoor portable gas burner;

Figure 2 is a diagrammatic drawing in partial section showing a modified embodiment of the indoor-outdoor gas burner of Figure 1;

Figure 3 is a diagrammatic drawing in partial section of a modified embodiment showing another novel removable gas burner;

Figure 4 is a diagrammatic in partial section of a modified transportable gas burner;

Figure 5 is a schematic and front elevation of a gas burner of the type shown in Figures 2 and 3 when placed under a set of artificial logs that are placed on a grate in a fireplace;

Figure 6 is an elevation view of a decorative cover which fits over the gas burners shown in Figures 1 and 3 and forms a portable storage carrier unit;

5 Figure 7 is a top view of the cover shown in Figure 5 showing additional features which make it useful as a cover for a propane tank;

Figure 8 is a side view of a grill support which stores inside of the decorative cover and is adapted to support conventional grids and stove top items for cooking;

10 Figure 9 is a detailed plan view looking at the bottom of a hollow ceramic fiber top unit showing a pattern of burner jets and the supporting structure which surrounds the gas manifold area; and

15 Figure 10 is a detailed plan view of a typical manual operable gas valve which is preferably used on all portable gas burner units and systems.

#### DESCRIPTION OF THE PREFERRED EMBODIMENTS

Refer now to Figure 1 showing a diagrammatic drawing in partial section of a preferred indoor-outdoor portable gas burner 10. Gas burner 10 comprises a base unit 11 preferably made from a thermoset plastic to provide a decorative unit which appears to be either a mound of coals or rocks surrounding a campfire. A ceramic fiber top 12 is fixed to the base unit 11 to provide a hollow manifold 13 therebetween which is adapted to receive a mixture of gas and air via the supply gas pipe 14. The gas pipe 14 is shown having an air shutter valve 15 which provides a mixture of gas from gas pipe 16 to pipe 14. The gas pipe 16 is shown connected to a manually operable gas valve 17 which is provided with a quick connection for accepting a connector 18 from a gas line 19 which may be connected to either a propane tank or a source of natural gas. The gas

valve 17 is shown coupled to a thermocouple 22 which has an actuating line 23 connected to the valve 17. In the preferred mode of operation for starting the burner 10, a plunger 21 is manually operate to supply gas to the manifold 13. The gas exits through burner jets 24 and when ignited will heat the thermocouple 22 which in turn will maintain the valve 17 open. The light weight reinforced ceramic fiber top 12 is preferably permanently attached to the base unit 11 by a high temperature silicon adhesive 25.

In the preferred embodiment of the present invention, the base unit 11 is provided with legs 26 which stand off from their support structure to permit air to enter into the hollow shell and be mixed by the air shutter valve 15.

Refer now to Figure 2 showing a diagrammatic drawing in partial section of a modified embodiment gas burner which is substantially identical to the gas burner shown in Figure 1 and uses identical numerals for the same elements as explained hereinbefore. The modified base unit 11 comprises a second element 11A in the form of a plate which connects to the ceramic fiber top 12 and is removably attached to the base unit so that the gas burner system may be used separate and apart from the base unit 11. For purposes of disconnecting the burner 10 from the base unit 11, there is provided a large central aperture 27 in the base unit 11 for receiving the gas valve structure through the aperture 27. The plate 11A is free to be detached and removed from the base unit 11. In this embodiment the plunger 21 is provided in an opening 28 which permits the unit 10 to be completely disconnected and removed from the decorative base 11.

Refer now to Figure 3 showing a diagrammatic drawing in partial section of a modified embodiment portable and replaceable removable gas burner unit.

5           The burner shown in Figure 3 is substantially identical to that shown in Figures 1 and 2 except that gas pipe 14 and air shutter valve 15 are built into the ceramic fiber top 12. The elements in Figure 3 which are the same as those in Figures 1 and 2 are numbered the same and do not require additional explanation. There is further shown a  
10           pair of leg extensions 29 which also serve as a mounting structure for the manual valve 17. When the burner unit 10 is removed from the base unit 11, the burner unit assembly may be placed on its legs 29 in an open space on a deck or in a fireplace or on the ground where no flammable material  
15           is present. It will be understood that the unit shown in Figures 2 and 3 are substantially identical in their mode of operation and the legs shown in Figure 3 may also be provided and connected to the plate 11A shown in Figure 2.

20           Refer now to Figure 4 showing a diagrammatic drawing in partial section of a modified embodiment transportable gas burner designed for being built into a custom system for a deck, patio or yard. The safety valve 17 is shown mounted through and supported by the surround edge of the burner base plate 11A. The leg extensions 29  
25           and the base unit 11 are replaced by a cylindrical metal support 29A which is sufficiently strong to protect the valve 17 and gas line 19 and the thermocouple activating line 23. In this preferred embodiment, the burner 10 is surrounded on the sides with rocks or other non combustible  
30           material to provide a built in or custom unit 10. When left in the open a cover (not shown) is placed over the unit to protect it from the weather.



Refer now to Figure 5 showing a schematic drawing in front elevation of a gas burner 10 of the type shown in Figures 2 and 3 which is placed under a set of artificial logs 30 which in turn are placed onto a grate 31, preferably located in a conventional fireplace or in a fabricated fireplace unit. The numerals used on the gas burner unit are the same as those in shown in Figures 2 and 3 and do not require further explanation. It will be understood and appreciated that this particular burner may be placed in a masonry fireplace where a grate used for burning wood is located. If the wood burning grate is not supplied with sufficient clearance, then the grate 31 may be substituted therefor and used for burning wood when the gas fireplace log set 30 is removed. In a typical scenario, most rustic cabins in the great outdoors do not have any natural gas or electricity readily available. Thus, when arriving at a cabin in a remote area, it is possible to set up the fireplace burner unit 10 shown in Figure 5 and rapidly heat the interior of the cabin. Going one step further, it is also possible to use the fireplace burner under the grate 31 and put a grill support, which will be explained in detail hereinafter, over the burner unit 10 and use it as a stove or grill. At some subsequent time, it is possible to remove the portable gas burner 10 and set up a wood burning fireplace in the same area.

Refer now to Figure 6 showing an elevation view of a decorative cover 32 for the burners shown in Figures 1 to 5. The cover also forms a portable storage carrier. In the preferred embodiment of the present invention, the molded cover is formed and colored to resemble a campfire comprising a plurality of stacked logs. Further, the cover

32 is provided with legs 33 which are used as a standoff when the cover 32 is placed over a propane tank.

Refer now to Figure 7 showing a top view of the decorative cover 32 in Figure 6 showing additional features which are useful when used as a propane tank cover. The vent slots 34 are also arranged as hand holds which extend outward from the cover 32 to prevent water from entering into the fireplace unit when it is in its storage condition. Further, there are shown a pair of buckle draw latches 35 which are permanently mounted on the decorative cover 32 and adapted to snap under the edge of the burner unit and are also used on the next to be described grill support unit.

Refer now to Figure 8 showing a grill support unit 36 which nests or fits inside of, and stores in, the decorative cover 32. The grill or stove support 36 is adapted to support the conventional grill elements which are found in outdoor grills. The grill support will also support a stove top item for cooking or serve as a stand-off for other types of cooking units which will be explained in greater detail hereinafter.

Refer now to Figure 9 showing in detail a plan view looking at the bottom of a hollow ceramic fiber top 12 and showing a pattern of burner jets and supporting structure which surrounds the H-shaped gas manifold area 13. Note that the outer perimeter of the ceramic fiber top 12 need not be circular in shape. The base unit 11A shown in phantom lines mounts to the bottom of unit 12 may be circular. The jet pattern for any particular gas system or burner unit may have different size jets for producing more efficient burning. Tests have shown that some patterns of holes and sizes are more efficient than others. There is also shown in phantom lines a hole 14A which is adapted to

5     receive the gas pipe 14. Further, there is shown a recessed  
passageway 12B which is adapted to receive a gas pipe when  
mounted in a horizontal plane as shown in Figure 3. It will  
be understood that the H-shaped area is recessed into the  
ceramic fiber top 12 and provides the aforementioned and  
described hollow manifold 13.

10     In the preferred embodiment of the present  
invention, a bead of adhesive is applied around the manifold  
area close to the outside parameter of the top unit 12  
before it is attached to either the base unit 11A or a base  
unit 11. Preferably the same adhesive is used to seal  
around the gas pipe 14 when it is connected to the recessed  
area 12B.

15     Refer now to Figure 10 showing a detail in plan  
view of a typical manually operable gas valve which is  
preferably used on all portable gas burner systems. The  
manually operated gas valve 17 shown is in a normally off  
condition before starting the gas burner. The gas line  
which is shown in Figure 2 as item 19 is connected to the  
inlet side of the gas valve 17 and the outlet or supply side  
is shown by numeral 16 as the gas outlet line. In order to  
turn the normally closed gas valve on, the manually operated  
plunger 21 is depressed allowing gas from inlet line 19 to  
appear at the outlet 16. When the gas begins to burn in the  
gas burner 10, it heats the thermocouple 22 which in turn  
creates a signal on actuator line 23 which will hold the gas  
valve open, otherwise releasing the plunger 21 will again  
close the gas valve and prevent the gas from reaching the  
manifold 13.

30     Having explained a preferred embodiment burner and  
two modifications thereof it will be understood that the  
novel portable gas burner is in fact a grill and a stove and

5 a fireplace burner as well as a camp fire and can serve all  
four purposes in the identical structural environment. Thus  
campers may take their burner system from their fireplace  
into their homes and take it with their campers and motor  
homes to a recreation site. Within a matter of minutes the  
burner can be set up for cooking and/or heating and/or  
grilling as the need may arise. While the gas burner system  
depicted in the present invention is an improvement over  
aforementioned prior art burners, it was particularly  
10 designed for and is capable of multiple functional uses  
whereas prior art gas burner systems were designed to have a  
single use.

WHAT IS CLAIMED IS:

1. A portable gas burner for fireplaces and for camp fires, comprising:

a base unit,

a ceramic fiber top connected to said base unit for forming a gas manifold therebetween and for receiving a mixture of gas and air,

said ceramic fiber top having a three dimensional contoured face,

a pattern of burner jets extending through said ceramic fiber top connecting into said gas manifold for creating a gas burner with a desired flame pattern,

connecting means for connecting a gas supply line to said gas manifold,

a primary air shutter valve connected to said gas supply line for adjusting the air gas mixture in said gas manifold, and

a manually operable gas valve for connection to a source of gas and having an outlet connectable to said gas supply line, and

said portable gas burner being disconnectable from the source of gas for transport or storage.

2. A portable gas burner as set forth in Claim 1 which further includes means for connecting and sealing said base unit to said ceramic fiber top.

3. A portable gas burner as set forth in Claim 1 wherein said means for connecting and sealing said base unit to said ceramic fiber top comprises a high temperature silicon base adhesive.

4. A portable gas burner as set forth in Claim 1 wherein said manually operable gas valve is normally closed and which further includes a thermocouple operably connected

5 to said manually operable gas valve for sensing the presence of a gas flame and opening said manual operable gas valve.

5. A portable gas burner as set forth in Claim 4 which further includes means for connecting said source of gas to said manually operable gas valve.

6. A portable gas burner as set forth in Claim 1 wherein said ceramic fiber top is formed as a bed of coals, and

5 said base unit comprises a hollow plastic shell formed as a mound of coals or stones.

7. A portable gas burner as set forth in Claim 6 wherein said base unit further comprises a flat plate connected to said ceramic fiber top which is detachably mounted to said hollow plastic shell for providing a  
5 removable burner.

8. A portable gas burner as set forth in Claim 6 wherein said hollow plastic shell comprises fiber glass reinforced thermoset plastic resin.

9. A portable gas burner as set forth in Claim 6 which further includes a decorative cover detachably mounted over said hollow plastic shell to form a storable cover for the gas burner and providing a decorative cover for burner  
5 equipment.

10. A portable gas burner as set forth in Claim 9 wherein said decorative cover further comprises latch means for attaching said decorative cover to said gas burner.

11. A portable gas burner as set forth in Claim 9 which further includes a truncated cone shaped grill support on said gas burner and nestable inside of said decorative cover.

12. A portable gas burner as set forth in Claim 11 wherein said base unit comprises a hollow shell having a central aperture,

5 a flat plate sealed to said ceramic fiber top and mounted on said hollow shell over said central aperture, and

leg means attached to said flat plate for providing a free standing burner for a campfire when removed from said hollow shell.

13. A portable gas burner as set forth in Claim 12 which further includes a fireplace grate for mounting over said burner and for supporting gas logs in a convertible fireplace unit.

14. A portable gas burner as set forth in Claim 1 which further includes a set of ceramic fireplace logs for stacking over said gas burner on said fireplace grate.

15. A portable gas burner as set forth in Claim 1 which further includes a set of ceramic camp fire logs for stacking over said gas burner for providing a gas camp fire.

Amendments to the claims have been filed as follows

WHAT IS CLAIMED IS:

1. A portable gas burner for fireplaces and for camp fires, comprising:

a base unit,

a ceramic fiber top connected to said base unit for forming a gas manifold therebetween and for receiving a mixture of gas and air,

said ceramic fiber top having a three dimensional contoured face,

a pattern of burner jets extending through said ceramic fiber top connecting into said gas manifold for creating a gas burner with a desired flame pattern,

connecting means for connecting a gas supply line to said gas manifold,

a primary air shutter valve connected to said gas supply line for adjusting the air gas mixture in said gas manifold, and

a manually operable gas valve for connection to a source of gas and having an outlet connectable to said gas supply line, and

said portable gas burner being disconnectable from the source of gas for transport or storage.

2. A portable gas burner as set forth in Claim 1 which further includes means for connecting and sealing said base unit to said ceramic fiber top.

3. A portable gas burner as set forth in Claim 1 wherein said means for connecting and sealing said base unit to said ceramic fiber top comprises a high temperature silicon base adhesive.

4. A portable gas burner as set forth in Claim 1 wherein said manually operable gas valve is normally closed and which further includes a thermocouple operably connected



5 to said manually operable gas valve for sensing the presence of a gas flame and opening said manual operable gas valve.

5. A portable gas burner as set forth in Claim 4 which further includes means for connecting said source of gas to said manually operable gas valve.

6. A portable gas burner as set forth in Claim 1 wherein said ceramic fiber top is formed as a bed of coals, and

5 said base unit comprises a hollow plastic shell formed as a mound of coals or stones.

7. A portable gas burner as set forth in Claim 6 wherein said base unit further comprises a flat plate connected to said ceramic fiber top which is detachably mounted to said hollow plastic shell for providing a  
5 removable burner.

8. A portable gas burner as set forth in Claim 6 wherein said hollow plastic shell comprises fiber glass reinforced thermoset plastic resin.

9. A portable gas burner as set forth in Claim 6 which further includes a decorative cover detachably mounted over said hollow plastic shell to form a storable cover for the gas burner and providing a decorative cover for burner  
5 equipment.

10. A portable gas burner as set forth in Claim 9 wherein said decorative cover further comprises latch means for attaching said decorative cover to said gas burner.

11. A portable gas burner as set forth in Claim 9 which further includes a truncated cone shaped grill support on said gas burner and nestable inside of said decorative cover.

12. A portable gas burner as set forth in Claim 11 wherein said base unit comprises a hollow shell having a central aperture,  
a flat plate sealed to said ceramic fiber top and mounted on said hollow shell over said central aperture, and  
leg means attached to said flat plate for providing a free standing burner for a campfire when removed from said hollow shell.

13. A portable gas burner as set forth in Claim 12 which further includes a fireplace grate for mounting over said burner and for supporting gas logs in a convertible fireplace unit.

14. A portable gas burner as set forth in Claim 13 which further includes a set of ceramic fireplace logs for stacking over said gas burner on said fireplace grate.

15. A portable gas burner as set forth in Claim 1 which further includes a set of ceramic camp fire logs for stacking over said gas burner for providing a gas camp fire.



17

Application No: GB 9902470.5  
Claims searched: 1-13

Examiner: Paul Jenkins  
Date of search: 12 April 1999

**Patents Act 1977**  
**Search Report under Section 17**

**Databases searched:**

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:  
UK Cl (Ed.Q): F4T (TC, TEB, TEC, TGX)  
Int Cl (Ed.6): A47J 37/07; F23D 14/00, 14/16, 14/46; F24C 1/16, 3/00, 3/14  
Other: Online: WPI, EPODOC, PAJ

**Documents considered to be relevant:**

Category	Identity of document and relevant passage	Relevant to claims
X	GB 2256920 A (LA BAIGUE)	1
A,P	WO 98/41797 A2 (MARSHALL)	1 & 14-15

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.

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